Abstract

Generation of variable differential group delay

An apparatus for generating variable DGD is particularly for use in a PMD compensator. The apparatus has first, second and third birefringent elements arranged in order between the input and output of the compensator and having first, second and third differential group delays (DGDs) in the ratio 1:2:1. The orientation of the PSPs of the signal in each element relatively to the principal axes of the element is controlled, such that a change in orientation between the first and second elements is equal and opposite to a change in orientation between the second and third elements. This arrangement provides symmetrical relative rotations of the signal PSPs and principal axes about the central birefringent element. In combination with the 1:2:1 ratio, it can be shown that compensation of any first order PMD can be achieved without the compensator introducing additional second order PMD. The required level of first order PMD compensation is selected by controlling the amount of the orientation changes.